

School District of La Crosse

# **8<sup>th</sup> Grade Math**

Developed for Implementation in 2008-2009

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# **Guiding Principles for Curriculum Development School District of La Crosse**

## **Board of Education's ENDS Policies Adopted 2001**

### **E-1 District Mission**

Students will discover their talents and abilities and will be prepared to pursue their dreams and aspirations while contributing effectively to their diverse communities.

### **E-2 Academic Achievement Goals**

Students will demonstrate continuous improvement toward a high level of individual success in all required and elective academic/curricular areas using multiple measures of performance.

### **E-3 Involved Citizenship**

Students will strive for mutual understanding as contributing citizens in a diverse world.

### **E-4 Responsible Life Choices**

Students will acquire the knowledge and skills necessary to make effective and responsible life choices.

## **Wisconsin Academic Model Standards**

All district curricula will be aligned to the Wisconsin Model Academic Standards available on the web at <http://www.dpi.state.wi.us/dpi/standards/matintro.html>

## **District Non-Discrimination Policy**

It is the policy of the School District of La Crosse that no person may be denied admission to any public school in this district or be denied participation in, be denied the benefits of, or be discriminated against in any curricular, extracurricular, pupil service, recreation, or other program or activity because of the person's sex, race, religion, national origin, ancestry, creed, pregnancy, marital or parental status, sexual orientation, or physical, mental, emotional, or learning disability or handicap as required by s. 118.13 Wis. Stats., and/or section 504 of the Rehabilitation Act of 1973.

# **Math, Grade 8 Curriculum Guide**

## **School District of La Crosse**

### **Goals and Instructional Practice**

Classroom practice should be aimed at creating a community of learners and scholars, a place where the teachers and students actively investigate and discuss mathematical ideas, using a wide variety of tools, materials, and technology. Classes should engage students in high-level mathematical thought that includes both conceptual and content understanding.

### **Important Goals/Expectations for Students in Math**

- to compute accurately and apply computation skills in a variety of real life settings.
- to develop a deep conceptual understanding in order to make sense of mathematics (including knowing how, when and why to apply skills and knowledge).
- to master specific knowledge necessary for its application to real problems, for the study of related subject matter, and for continued study in mathematics.
- to learn and view mathematics as a way of thinking about and interpreting the world around them.
- to recognize that mathematics is a creative part of human culture in much the same way as music or fine art.
- to represent and record problem solving using pictures, numbers, words and voice.
- to recognize that some problems have more than one solution.

### **Goal/expectation for teachers:**

- to provide experiences, explorations, enrichment and supplementary lessons that will enhance district learner outcomes/benchmarks.

### **District Goals : Wisconsin State Content Standards B-F**

- Goal One:** Students will use numbers effectively for various purposes such as counting, measuring, estimating and problem solving.
- Goal Two:** Students will use geometric concepts, relationships and procedures to interpret, represent and solve problems.
- Goal Three:** Students will select and use appropriate tools and techniques to measure things to a specified degree of accuracy. They will use measurement in problem solving situations.
- Goal Four:** Students will use data collection and analysis, statistics and probability in problem solving situations.
- Goal Five:** Students will use, discover, describe and generalize simple and complex patterns and relationships. In the context of real-world problem situations, the students will use algebraic techniques to define and describe the problem to determine and justify appropriate solutions.

# Eighth Grade Math

**Unit:** Moving Straight Ahead

**Time Line:** Days 30 (4 Investigations)  
End Date: 3<sup>rd</sup> Week of October

**Unit Sub-Topics:**

Linear relationships, solving linear equations, finding slope, finding rate of change, finding y-intercept, patterns of change between independent and dependent variables, linear tables, graphs and equations

**Wisconsin State Standards:**

A.8.1, A.8.2, A.8.3, A.8.4, A.8.5, A.8.6, B.8.1, B.8.5, B. 8.7, C.8.5, D.8.1. E.8.1, E.8.2, E.8.4, E.8.5, E.8.6, E.8.7, F.8.1, F.8.2, F.8.3, F.8.4, F.8.5

**Learner Outcomes:**

Can write and interpret linear equations in  $y = mx + b$  form  
Knows the concept of function  
Graphs first degree linear equations  
Can identify x and y intercept from a graph or an equation  
Can find the slope of a line

**Instructional Strategies:**

Investigations, Group Work, Storytelling  
Demonstrations, Discussions,  
Individual practice, and Real-life application

**Integration:**

Economics and Finance: Value of Money and shopping  
Reading: Comprehending the problems  
Physical Education: Walkathons  
Science: Rising temperature rates  
Construction and Manufacturing: graphing

**Suggested Activities/Resources:**

Moving Straight Ahead Workbook, Additional Practice and Skills Workbook

**Suggested Assessments:**

Homework and ACE problems  
Investigation Quizzes and Check-ups  
District Unit Test  
Notebooks/Binders

# **Eighth Grade Math**

**Unit:** Samples and Populations: Data and Statistics

**Time Line:** Days 20 (4 Investigations)  
End Date: 3<sup>rd</sup> Week of December

**Unit Sub-Topics:**

Statistical investigations, drawing conclusions about populations, sample size, sampling plans, box and whisker, histograms, mean, median, range, minimum and maximum data values, percentiles

**Wisconsin State Standards:**

A.8.1, A.8.2, A.8.3, A.8.4, A.8.5, A.8.6,  
B.8.1, B.8.4, B.8.7, D.8.1, E.8.1, E.8.2,  
E.8.3, E.8.4, E.8.5, E.8.6, E.8.7

**Learner Outcomes:**

Compares data on box plots  
Uses organized means to show distribution of data  
Can explain how statistics can be misleading  
Can conduct box and whiskers plots  
Solves percent application problems  
Makes predictions with statistical data  
Knows concept of expected value

**Instructional Strategies:**

Investigations, Group Work, Storytelling  
Demonstrations, Discussions,  
Individual practice, and real-life application

**Integration:**

Consumer Education: Cost per serving, sodium content, store verses name brand  
Science/Biology: Fish and Wildlife  
Science/Archaeology: Length of arrowheads  
Health: Life Expectancy, Arm span in portion to height, healthy snacks  
Reading: Comprehending the problems

**Suggested Activities/Resources:**

Samples and Populations Workbook, Additional Practice and Skills Workbook  
Surveying a population about an interest

**Suggested Assessments:**

Homework and ACE problems  
Investigation Quizzes and Check-ups  
District Unit Test  
Notebooks/Binders

# **Eighth Grade Math**

**Unit:** Looking for Pythagoras

**Time Line:** Days 25 (4 Investigations)  
End Date: 2<sup>nd</sup> Week of February

**Unit Sub-Topics:**

Area of a square, square roots, irrational numbers, distance between two points, Pythagorean Theorem

**Wisconsin State Standards:**

A.8.1, A.8.2, A.8.3, A.8.4, A.8.5, A.8.6,  
B.8.2, C.8.1, C.8.2, C.8.5, D.8.1, D.8.2,  
D.8.3, D.8.4, D.8.5, F.8.5

**Learner Outcomes:**

Can write rational numbers as decimals  
Can find the distance between two points using the Pythagorean Theorem  
Uses the Pythagorean Theorem  
Finds square roots for perfect squares  
Finds approximate square roots of numbers  
1-100 for numbers which are not perfect squares

**Instructional Strategies:**

Investigations, Group Work, Storytelling  
Demonstrations, Discussions,  
Individual practice, and real-life application

**Integration:**

Social Studies: Cartography  
Reading: Comprehending the problems  
History: History of Pythagorean and the Egyptians  
P.E.: Baseball  
Theater: Wizard of Oz: Scarecrow

**Suggested Activities/Resources:**

Looking for Pythagoras Workbook, Additional Practice and Skills Workbook

**Suggested Assessments:**

Homework and ACE problems  
Investigation Quizzes and Check-ups  
District Unit Test  
Notebooks/Binders

# Eighth Grade Math

**Unit:** Growing, Growing, Growing (Exponential Relationships)

**Time Line:** Days 25 (4 Investigations)  
End Date: 2<sup>nd</sup> Week in March

**Unit Sub-Topics:**

Identify and construct exponential relationships on a table, graph and equation, exponential growth and decay factors and rates, compare linear and exponential relationship, understands and applies rules for operating on numerical expressions with exponents

**Wisconsin State Standards:**

A.8.1, A.8.2, A.8.3, A.8.4, A.8.5, A.8.6,  
B.8.1, B.8.2, B.8.3, B.8.4, B.8.5, B.8.7,  
C.8.5, D.8.1, D.8.3, D.8.4, E.8.1, E.8.2,  
E.8.4, E.8.5, E.8.6, F.8.1, F.8.2, F.8.3,  
F.8.5

**Learner Outcomes:**

Can build and analyze exponential models

Can represent and interpret exponential relationships

Can describe the effects of varying the values of a and b in the equation  $y = a(b)^x$  on the graph of that equation

Can compare and contrast exponential relationship with linear relationships

**Instructional Strategies:**

Investigations, Group Work, Storytelling

Demonstrations, Discussions,

Individual practice, and real-life application

**Integration:**

Science: The Water hyacinth, moldy bread, bugs, snakes, dogs rabbits reproducing, cooling coffee

Economics: Value of money, getting a job

Reading: Comprehending the problems

Social Studies: Population growth

**Suggested Activities/Resources:**

Growing, Growing, Growing Workbook, Additional Practice and Skills Workbook

**Suggested Assessments:**

Homework and ACE problems

Investigation Quizzes and Check-ups

District Unit Test

Notebooks/Binders

# Eighth Grade Math

**Unit:** Say it With Symbols: Making Sense of Symbols

**Time Line:** Days 30 (5 Investigations)  
End Date: 2nd Week in May

**Unit Sub-Topics:**

Symbolic expressions, equivalent expressions, solving linear equations with parentheses, factoring quadratic expressions, distributive and commutative properties, expanded form, factored form order of operations

**Wisconsin State Standards:**

A.8.1, A.8.2, A.8.3, A.8.4, A.8.5, A.8.6,  
B.8.1, B.8.2, B.8.3, B.8.4, B.8.5, B.8.6,  
B.8.7, C.8.1, D.8.1, D.8.4, F.8.1, F.8.2,  
F.8.3, F.8.4, F.8.5

**Learner Outcomes:**

Uses the order of operations for +, -, X, /including nested parentheses and exponents

Can solve simple quadratic relationships with some sense of basic factoring

Knows and can apply concepts of commutative, associative, and distributive and can identify which are inverse operations

Solves equations of the form  $x^2=16$

Knows equality products \*can add something to both sides of an equation, subtract, multiply and divide

Knows how to solve 2 step problems

Can identify x and y intercept form a graph or an equation

**Instructional Strategies:**

Investigations, Group Work, Storytelling

Demonstrations, Discussions,

Individual practice, and real-life application

**Integration:**

Construction: Measuring Tiles

Health: Walkathons. Soccer

Business: Profit, Income and Expenses

Reading: Comprehending the problems

History: Ancient Greeks

**Suggested Activities/Resources:**

Say it With Symbols Workbook, Additional Practice and Skills Workbook

**Suggested Assessments:**

Homework and ACE problems

Investigation Quizzes and Check-ups

District Unit Test

Notebooks/Binders